

REMARKS

Claims 1-40, all the claims pending in the application, stand rejected on prior art grounds. Claims 1, 9, 14, 20, 27, 35, and 40 are amended herein. Applicants respectfully traverse these rejections based on the following discussion.

I. The Prior Art Rejections

Claims 1-2, 6-8, 10-11, 14-15, 19-21, 23-24, 27-28, 32-34, 36-37, and 40 stand rejected under 35 U.S.C. §102(a) and 35 U.S.C. §102(e) as being anticipated by Holland et al. (U.S. Publication No. 2003/0188097), hereinafter referred to as "Holland". Claims 3-5, 9, 12-13, 16-18, 22, 25-26, 29-31, 35, and 38-39 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Holland, in view of Jacobson et al. (U.S. Patent No. 5,392,244), hereinafter referred to as "Jacobson". Applicants respectfully traverse these rejections based on the following discussion.

Holland teaches a data storage methodology wherein a data file is initially stored in a format consistent with RAID-1 and RAID-X and then migrated to a format consistent with RAID-X and inconsistent with RAID-1 when the data file grows in size beyond a certain threshold. Here, RAID-X refers to any non-mirrored storage scheme employing XOR-based error correction coding (e.g., a RAID-5 configuration). Each component object (including the data objects and the parity object) for the data file is configured to be stored in a different stripe unit per object-based secure disk. Each stripe unit may store, for example, 64 KB of data. So long as the data file does not grow beyond the size threshold of a stripe unit (e.g., 64 KB), the parity stripe unit contains a mirrored copy of the data stored in one of the data stripe units because of the exclusive-ORing of the input data with "all zeros" assumed to be contained in

empty or partially-filled stripe units. When the file grows beyond the size threshold, the parity stripe unit starts storing parity information instead of a mirrored copy of the file data. Thus, the data file can be automatically migrated from a format consistent with RAID-1 and RAID-X to a format consistent with RAID-X and inconsistent with RAID-1 without the necessity to duplicate or rewrite the stored data.

Jacobson teaches a disk array has a plurality of disks, a disk array controller for coordinating data transfer to and from the disks, and a RAID management system for mapping two different RAID areas onto the disks. The RAID management system stores data in one of the RAID areas according to mirror redundancy, and stores data in the other RAID area according to parity redundancy. The RAID management system then shifts or migrates data between the mirror and parity RAID areas on the disks in accordance with a predefined performance protocol, such as data access recency or access frequency.

The claimed invention, as provided in amended independent claims 1, 14, 27, and 40 contain features, which are patentably distinguishable from the prior art references of record.

Specifically, amended independent claim 1 recites, “[a] method of performing data redundancy, said method comprising: storing a variably sized object capable of changing a number of bytes of data included therein in an object storage device, wherein said variably sized object experiences a period of changing size followed by a period of having a stable size; temporarily storing a duplicate of said variably sized object in a second object storage device separate from said first object storage device; converting said variably sized object into any of a grouped object Redundant Array of Independent Disks (RAID) layout and an individual RAID layout as said variably sized object changes in size, wherein said step of converting occurs when

a size of said variably sized object remains dormant for a predetermined period of time; and discarding the duplicate variably sized object.” These features are neither taught nor suggested in the prior art of record.

Amended independent claim 14 recites, “[a] method of performing data redundancy, said method comprising: storing a variably sized object capable of changing sizes in a first object storage system, wherein said variably sized object is independent of any other object, and wherein a size of said variably sized object initially remains stable followed by a period of changing sizes followed by a period of being stable; mirroring said variably sized object; temporarily storing the mirrored variably sized object in a second object storage system separate from said first object storage system; converting said variably sized object into any of a grouped object Redundant Array of Independent Disks (RAID) layout and an individual RAID layout upon growth of said variably sized object, wherein said step of converting occurs when a size of said variably sized object remains dormant for a predetermined period of time; and discarding the mirrored variably sized object.” These features are neither taught nor suggested in the prior art of record.

Amended independent claim 27 recites, “[a] system for performing data redundancy comprising: a set of object storage devices; a variably sized object capable of changing sizes by changing a number of bytes of data included therein in a first object storage device, wherein said variably sized object experiences a period of changing size followed by a period of having a stable size; a redundancy data management controller operable for duplicating said variably sized object; a second object storage device separate from said first object storage device and operable for temporarily storing the duplicated variably sized object; a data converter operable for

converting said variably sized object into any of a grouped object Redundant Array of Independent Disks (RAID) layout and an individual RAID layout when said object changes in size, wherein said converting occurs when a size of said variably sized object remains dormant for a predetermined period of time; and a data purger operable for discarding the duplicated variably sized object." These features are neither taught nor suggested in the prior art of record.

Amended independent claim 40 recites, "[a] system for performing data redundancy comprising: means for storing a variably sized object capable of changing a number of bytes of data included therein in a first object storage system, wherein said variably sized object is independent of any other object, and wherein a size of said variably sized object initially remains stable followed by a period of changing sizes followed by a period of being stable; means for mirroring said variably sized object; means for temporarily storing the mirrored variably sized object in a second object storage system separate from said first object storage system; means for converting said variably sized object into any of a grouped object Redundant Array of Independent Disks (RAID) layout and an individual RAID layout upon growth of said variably sized object, wherein said converting occurs only when a size of said variably sized object remains dormant for a predetermined period of time; and means for discarding the mirrored variably sized object." These features are neither taught nor suggested in the prior art of record.

Page 3 of the Office Action suggests that Figure 7 and Paragraph [0050] of Holland teaches a variably sized object that initially remains stable followed by a period of changing sizes followed by a period of being stable. However, closer scrutiny of the cited paragraph and figure in Holland reveals no such teaching. In fact, paragraph [0050] of Holland merely states:

FIG. 7 is an exemplary flowchart illustrating the storage methodology of the present invention wherein a data file is

migrated from RAID-1 to RAID-5 storage configuration without rewriting the data contained in the data file. It is noted that, in addition to RAID-5, the storage methodology described hereinbelow equally applies to migration of a data file from RAID-1 to any non-mirrored storage scheme that employs an XOR-based error correcting code (e.g., RAID-4). The RAID-1 to RAID-5 migration discussed below is given as an example to illustrate the data file migration principles of the present invention and therefore should not be construed to limit the scope of the present invention to migration of a data file from RAID-1 to RAID-5 only.

There is nothing in the above-quoted language that remotely refers to variably sized objects or the fact that the objects are variably sized followed by a period of stability (in terms of size). Moreover, there is nothing in Holland that indicates that the second data storage system/device is separate from the first data storage system/device. Rather, the Office Action (page 3) merely indicates that "The Examiner notes that the data files is initially stored in a RAID-1 and thus a duplicate is stored as per RAID-1 specifications." However, there is no indication in Holland where this storage occurs. Figure 7 of Holland is likewise silent as to these features.

Holland's data files continue to grow (see paragraph [0020], and once they pass a 64 KB threshold, the parity stripe unit stores the parity information instead of mirror copying the data files. Accordingly, Holland's data files do not have periods of stability, because if they did then there would be no need for Holland's invention.

Additionally, page 9 of the Office Action states that column 4, line 67 to column 5, line 7 of Jacobson teaches that the step of converting occurs when a size of the variably sized object remains dormant for a predetermined period of time. However, a closer reading of the cited language in Jacobson reveals no such teaching. Specifically, Jacobson recites:

Less frequently accessed data is maintained in the parity RAID area 22. According to a second migration policy, known as "access recency", the most recently accessed data is maintained in the mirror RAID area 18 while the remaining data is stored in parity RAID area 22. Other performance protocols may be employed. Ideally, such protocols are defined based upon the specific computer application.

As indicated above, Jacobson does not teach that the "converting occurs when a size of said variably sized object remains dormant for a predetermined period of time" let alone that "converting only occurs when a size of said variably sized object remains dormant for a predetermined period of time" as provided in amended dependent claims 9, 20, and 35. Accordingly, a combination of Holland and Jacobson fails to teach the Applicant's claimed invention.

Insofar as references may be combined to teach a particular invention, and the proposed combination of Holland and Jacobson, case law establishes that, before any prior-art references may be validly combined for use in a prior-art 35 U.S.C. § 103(a) rejection, the individual references themselves or corresponding prior art must suggest that they be combined. However, there is nothing in each of the references that suggests such a motivation to combine as suggested in the Office Action. In fact, had such a motivation been anticipated in any of the prior art references, then surely some discussion regarding alternative embodiments or manners of combination would have been suggested or at least inferred in any of the prior art references. In fact, no suggestion for combination is provided in any of the prior art references.

In In re Semaker, 217 U.S.P.Q. 1, 6 (C.A.F.C. 1983), the court stated: "[P]rior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings."

Furthermore, the court in Uniroyal, Inc. v. Rudkin-Wiley Corp., 5 U.S.P.Q.2d 1434 (C.A.F.C. 1988), stated, “[w]here prior-art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself. . . . Something in the prior art must suggest the desirability and thus the obviousness of making the combination.” There is nothing in the prior art that refers to a suggestion or desirability of making the proposed combination. Accordingly, the rejection under 35 U.S.C. §103(a) is prima facie defective.

In the present application, the reason given to support the proposed combination is improper, and is not sufficient to selectively and gratuitously substitute parts of one reference for a part of another reference in order to try to meet, but failing nonetheless, the Applicant’s novel claimed invention. Moreover, there is nothing in the prior art references themselves, namely Holland and Jacobson, which suggests a motivation to combine elements from each reference in a manner consistent with the suggestion by the Office Action. Furthermore, the claimed invention meets the above-cited tests for obviousness by including embodiments such as “wherein said variably sized object experiences a period of changing size followed by a period of having a stable size, . . . , a second object storage device separate from said first object storage device, . . . , and said converting occurs when a size of said variably sized object remains dormant for a predetermined period of time. . . .” As such, all of the claims of this application are, therefore, clearly in condition for allowance, and it is respectfully requested that the Examiner pass these claims to allowance and issue.

As declared by the Federal Circuit:

In proceedings before the U.S. Patent and Trademark Office, the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior

art. The Examiner can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. In re Fritch, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992) citing In re Fine, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

Here, the Examiner has not met the burden of establishing a prima facie case of obviousness. It is clear that, not only does Holland fail to disclose all of the elements of the claims of the Applicant's claimed invention, but also, if combined with Jacobson, fails to disclose these elements as well. The unique elements of the claimed invention are clearly an advance over the prior art.

The Federal Circuit also went on to state:

The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. . . . Here the Examiner relied upon hindsight to arrive at the determination of obviousness. It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. Fritch at 1784-85, citing In re Gordon, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

Here, there is no suggestion that Holland, alone, or in combination Jacobso teaches a structure and method containing all of the limitations of the claimed invention. Consequently, there is absent the "suggestion" or "objective teaching" that would have to be made before there could be established the legally requisite "prima facie case of obviousness." In view of the foregoing, the Applicant respectfully submits that the collective cited prior art do not teach or suggest the features defined by amended independent claims 1, 14, 27, and 40 and as such, claims 1, 14, 27, and 40 are patentable over Holland, alone, or in combination with Jacobson.

Further, dependent claims 2-13, 15-26, and 28-39 are similarly patentable over Holland, alone, or in combination with Jacobson, not only by virtue of their dependency from patentable independent claims, respectively, but also by virtue of the additional features of the invention they define. Thus, the Applicants respectfully request that these rejections be reconsidered and withdrawn.

Additionally, because Jacobson deals only with fixed sized blocks, it would not be logical or obvious to combine it with Holland, which teaches that the object continues to grow. In fact, the USPTO, in classifying each of Holland and Jacobson has classified them in separate classes. For example, Jacobson has been classified in U.S. Class 365/200; 395/425; 395/275; 395/725; 371/10.1; 371/21.1; and 371/40.1 with a Field of Search in classes 365/201, 200; 371/10.1; 371/21.1, 40.1; 395/425, 275, 725, 200. Conversely, Holland has been classified in U.S. Class 711/114. Accordingly, there are no overlapping classes; thus one of ordinary skill in the art would not be properly motivated to combine Holland and Jacobson in the manner suggested in the Office Action.

Moreover, the Applicants note that all claims are properly supported in the specification and accompanying drawings, and no new matter is being added. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

II. Formal Matters and Conclusion

With respect to the rejections to the claims, the claims have been amended, above, to overcome these rejections. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections to the claims.

10/723,480

18

In view of the foregoing, Applicants submit that claims 1-40, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary. Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0441.

Respectfully submitted,

Dated: September 29, 2006



Mohammad S. Rahman
Registration No. 43,029

Gibb I.P. Law Firm, LLC
2568-A Riva Road, Suite 304
Annapolis, MD 21401
Voice: (301) 261-8625
Fax: (301) 261-8825
Customer Number: 29154